SOME POTENTIAL CHEMICAL TERRORISM AGENTS AND SYNDROMES (including biologic toxins)

Agents	Symptom Onset	Symptoms	Signs	Clinical Diagnostic Tests	Decon-tamin-ation	**Exposure route** and treatment (adult dosages)	Differential diagnostic considerations
Nerve agents	Vapor: seconds Liquid: minutes to hours	**Moderate exposure** : Diffuse muscle cramping, runny nose, difficulty breathing, eye pain, dimming of vision, sweating, **High exposure** : The above plus sudden loss of consciousness, flaccid paralysis, seizures	Pinpoint pupils (miosis) Hyper-salivation Diarrhea Seizures	Red Blood Cell or serum cholinesterase (whole blood) **Treat for signs and symptoms; lab tests only for later confirmation** Collect urine for later confirmation and dose estimation	Rapid disrobing Water wash with soap and shampoo	**Inhalation & dermal absorption** Atropine (2mg) iv or im (titrate to effect up to 6 to 15 mg) 2-PAMCI 600mg injection or 1.0 g infusion over 20-30 minutes Additional doses of atropine and 2-PAMCI depending on severity, Diazepan or lorazepam to prevent seizures if >4 mg atropine given Ventilation support	Pesticide poisoning from organophosphorous agents and carbamates cause virtually identical syndromes
Cyanide	Seconds to minutes	**Moderate exposure:** Dizziness, nausea, headache, eye irritation **High exposure** : Loss of consciousness	**Moderate exposure:** non-specific findings **High exposure** : convulsions, cessation of respiration	Cyanide (blood) or thiocyanate (blood or urine) levels in lab. **Treat for signs and symptoms; lab tests only for later confirmation**	Clothing removal	**Inhalation & dermal absorption** Oxygen (face mask) Amyl nitrite Sodium nitrite (300mg iv) and sodium thiosulfate (12.5g iv)	Similar CNS illness results from: Carbon monoxide (from gas or diesel engine exhaust fumes in closed spaces) H_2S (sewer, waste, industrial sources)
Blister Agents	2-48 hours	Burning, itching, or red skin Mucosal irritation (prominent tearing, and burning and redness of eyes) Shortness of breath Nausea and vomiting	Skin erythema Blistering Upper airway sloughing Pulmonary edema Diffuse metabolic failure	Often smell of garlic, horseradish, and mustard on body Oily droplets on skin from ambient sources No specific diagnostic tests	Clothing removal Large amounts of water	**Inhalation & dermal absorption** Thermal burn type treatment Supportive care For Lewisite and Lewisite/Mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol)	Diffuse skin exposure with irritants, such as caustics, sodium hydroxides, ammonia, etc., may cause similar syndromes. Sodium hydroxide (NaOH) from trucking accidents
Pulmo-nary agents (pho-sgene etc)	1 – 24 (rarely up to 72 hours)	Shortness of breath Chest tightness Wheezing Mucosal and dermal irritation and redness	Pulmonary edema with some mucosal irritation (more water solubility = more mucosal irritation)	No tests available but source assessment may help identify exposure characteristics (majority of trucking incidents generating exposures to humans have labels on vehicle)	None usually needed	**Inhalation** Supportive care Specific treatment depends on agents	Inhalation exposures are the single most common form of industrial agent exposure (eg: HCl, Cl_2, NH_3) Mucosal irritation, airways reactions, and deep lung effects depend on the specific agent, especially water-solubility
Ricin (castor bean toxin)	18 – 24 hours	**Ingestion:** Nausea, diarrhea, vomiting, fever, abdominal pain **Inhalation:**, chest tightness, coughing, weakness, nausea, fever	Clusters of acute lung or GI injury; circulatory collapse and shock	ELISA (from commercial laboratories) using respiratory secretions, serum, and direct tissue	Clothing removal Water rinse	**Inhalation & Ingestion** Supportive care For ingestion: charcoal lavage	Tularemia, plague, and Q fever may cause similar syndromes, as may CW agents such as Staphylococcal enterotoxin B and phosgene
T-2 myco-toxins	2-4 hours	Dermal & mucosal irritation, blistering, and necrosis Blurred vision, eye irritation Nausea, vomiting, and diarrhea Ataxia Coughing and dyspnea	Mucosal erythema and hemorrhage Red skin, blistering Tearing, salivation Pulmonary edema Seizures and coma	ELISA from commercial laboratories Gas chromatography/Mass spectroscopy in specialized laboratories	Clothing removal Water rinse	**Inhalation & dermal contact** Supportive care For ingestion: charcoal lavage Possibly high dose steriods	Pulmonary toxins (O_3, NO_x, phosgene, NH_3) may cause similar syndromes though with less mucosal irritation.

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